

SEQUENCE LISTING

(1) GENERAL INFORMATION:

5

(I) APPLICANT: THE NATIONAL UNIVERSITY OF SINGAPORE

(ii) TITLE OF INVENTION: DIAGNOSIS OF PARASITES

10

(iii) NUMBER OF SEQUENCES: 22

(iv) CORRESPONDENCE ADDRESS:

15

(A) ADDRESSEE: DAVIES COLLISON CAVE

(B) STREET: 1, LITTLE COLLINS STREET

(C) CITY: MELBOURNE

(D) STATE: VIC

(E) COUNTRY: AUSTRALIA

(F) ZIP: 3000

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(v) COMPUTER READABLE FORM:

(A) MEDIUM TYPE: Floppy disk

(B) COMPUTER: IBM PC compatible

(C) OPERATING SYSTEM: PC-DOS/MS-DOS

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(D) SOFTWARE: PatentIn Release #1.0, Version #1.25

(vi) CURRENT APPLICATION DATA:

(A) APPLICATION NUMBER: PCT INTERNATIONAL

(B) FILING DATE: 6-FEB-1998

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(vii) PRIOR APPLICATION DATA:

(A) APPLICATION NUMBER: AU P04953

(B) FILING DATE: 6-FEB-1997

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(vii) PRIOR APPLICATION DATA:

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(B) FILING DATE: 21-APR-1997

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(vii) PRIOR APPLICATION DATA:

(A) APPLICATION NUMBER: AU P09481

(B) FILING DATE: 26-SEP-1997

(viii) ATTORNEY/AGENT INFORMATION:

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5 (ix) TELECOMMUNICATION INFORMATION:

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10 (2) INFORMATION FOR SEQ ID NO:1:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 5849 base pairs

(B) TYPE: nucleic acid

(C) STRANDEDNESS: single

15 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:1:

20  
TAATGAAGCT GTACATCCTT CTAAATATCC AACATATGCA AATTCACCTG CTATTAATAA 60  
AGTACGTTCA AATTGTGCAA AATCATAAGA ATTAGTCTTA AAATAAGTTG ATAAATTAAA 120  
25 ACTACATTTT ATATACTTAG ACACATAACA AAAAGATCCT TCACTAAAAA TAATTGAATT 180  
AATATTTGCA AAAAAATTAT CTTTATAAGA AACTACAGTT CCTAAATATT TTTTACTAA 240  
TAAAGGATAT TTAAAATAA CGTCCAATAA AGACAAAAAT ATAATACCTA ATTTTTTTAA 300  
30 AAAATATTGT GTTGATGTA AAACAGATAT ACTATCACA ATAACATCAA TAGGAATTAT 360  
TTTTTTATTA AAATAGGTAT CTAAAAATT TATATTTAAA TTAGTTTTTA AATATACTAA 420  
35 CAAATTACTA TCTTTTAAAG TAGAAGAATA ATAAATAATA TTATCATAAC TAATATTGGG 480  
ACATTGAAA CACGACCAAT CTGGTAATTT AACATATTT AAAAATTTTA AAGAATATAT 540  
TTTAAATTTG TAAATAAAAA AATATAAATA AATATTATTA GATAAATTTT TTATCAAATT 600  
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TTTATTTAAT CCATTTCTTA TTAAATATAA ATTTATTTTA TTATTATATT GATATTTATA 660  
ATTTAAATTA TAAATATTTA AAAATTTTTT TAATTTTAAT TTATTTATCA TAATAATTTT 720  
5 ATATTATAAA ATATTTCAAG TTAACGATGA GATTTGAAC TACAATCTAC TGATTACAAA 780  
TCAGTTGCTT TACCAATTAA GCCACTTTAA CAAATATAAT ATTTATAATT AAATATTCAA 840  
CTTATTAGGA ATTATACACA AAATATATTA CTATAAATAC ATATTAATTC TATAAAATAA 900  
10 TTTTCTAAT TATTGTTTA TTCATTATA TGATTAGAAT ATTATTTTAA ATTAAATTTT 960  
CTTATTTATA TTAATTCAAC AATTAAAATT TTATACTTAA CTACTCAACA TTACAAAATA 1020  
15 TAATAATTGA TATATCATTG GTATAATTTT TTCGATCCTC TCGTACTAGA AAAAATAATT 1080  
TCAATATTCT AACACTTATA TTAGATATGG ACCGAAC TGT CACGACGT TCTGAACCCA 1140  
GCTCACGTAT CGCTTTAATA GGCGAACAGA CTTACCCTTA AACATACTA CTGCCTTAGG 1200  
20 ATGCGATAAG CCGACATCGA GGTGCCAAC CTTTTCGTCA ATATGGACTC TCGGAAAAGA 1260  
TTAGCCTGTT ATCCCTAGAG TAACTTTTAT CCGTTAAGCG ATAATTTTAT TATTAAATAA 1320  
25 TTATCGGATC ATTAAGACCG ACATTAATCT CTGTTTAATT TGTAAATTTT ACAGTTAATT 1380  
ATATATTTAT CTTTATATAA TAAATATAAC ATTGTACACC TCCGTTTTTA TATAGGAGGA 1440  
GACCGCCCCA GTCAACTAT CTTATAAATA TTGTTAAAAA TTTTGTATA AAAATTTTAT 1500  
30 AAGAATTTAT ATATATATAA AATGGTATT CATTACAAT TACATTATTT CCAAAAAAAT 1560  
AATATTACTA CTTCCCATTT ATTCTATGTT ATATATATAT ATTTTCAATA TCTATTAATA 1620  
35 GTAAAGCTTC ATAGGGTCTT TCTGTCCTAA TATAAGAAAT CTGCATCTTC ACAGATAATT 1680  
TTATTTCAAT AAGATTTTTT TTAAGACAGC ATTTAAGTCG TTACATCTTT CATGCAGGTC 1740  
GGAACCTTACC CGACAAGGAA TTTGCTACC TTTGGACCGT TATAGATACA GCCGCCGTTT 1800  
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	ACTATAGCTT ATATATATAT TATAATTTTA AATTATAAAT ATTATTTTTC CATAATAGCA	1860
	CTGGGCAGAT GTCAATCTTT ATACATCATC TTTCGATTTC GCAAAGATTT GTGTTTTTGT	1920
5	TAAACAGTCG CTTAAATTTT TTGTTTTCAA CTAAATAAGT ATCTCTTCTC CCCTAAGTTT	1980
	ACGAGATAAA TTTGCCGAGT TCCTTAAAAA AAATTATCTC AACTTCTTAA TAATTTATAT	2040
10	ATATTTACTA GTGTCAGTTT ACAGTACGAA TACATAATAA TATATATATA TAAATAATTT	2100
	TTATATAATA TAATATATTT ATTATTATAT TAGTTTTAAA ATATAAATAT TATTATATAG	2160
	TATAAGAATA TTAACCTTATT ACCTATCGAT TACACATTAC ATCTCATCTC AAGATACGAC	2220
15	TAACCCCTATT TAAATAAATA ATAAATAGGA GCCCTTAAAT TATAGAAGTA TTGGATTTTT	2280
	ACCAATATTT ACATTACTCA AATTAGCATT ATCACTTTTG ATATAATTAT TTAACTTTTT	2340
20	CATATAAATA ATTTATATTC AAAACGCTCT TTTACCAATT TAATTTTATT AATATTAAAT	2400
	TTTATACATA TCGATAATTA ATTTATTTTC GATTATTTCT GAACTAAAAT TACTAAATTA	2460
	ATGAGCTTTT ACGCACTCTT TAAAAGATAA CTGCTTCTAA ATTTACTTTT TAATTATTTA	2520
25	AATAATTTTA TATTCTTTTT AAGACTTAAT TAATATTTAA AAATCTTAAT TTATAATTCG	2580
	GGCTGTTTTCC CTTTTGAAAA TAAAGCTTAT CCTTTATTTT CTGATCATAT ATATATTTTA	2640
30	TTAAATAAAA TTCTTAAATT ATTTTCATTA ATATTAACCTA TATAAATTAA TTTAATAAAA	2700
	AAAGAGTTTT ACATTTATTT ATATATAAAT ACTATACTTA CATATATTTT AAAGAGAACC	2760
	AGCTATCTTC AAATTCGATT GGCATTTTAC CTCTAATTAT ACTTTATTTG ATACTTTTGC	2820
35	AACAGTAACC AATTCAACT TCAATTTAAT TTTATTTAAA TCTTATTTTA AATATAATTA	2880
	GATCATTTGA TTTCGGGTCT ATAATAAATA ATATACTAAA TGCTTATTAT ATATAATAAC	2940
40	AAACTCGAGT ATACTTTGGC TTCATTTATA AATATTTAAC CTAATAATTA TACTATTTAT	3000

TATAACTTGC TAATTCTTTC TTCAACAAGA AAATAATAAA ATTATATTAA ATTTTATTAT 3060

TATTTATTAA ATTTAAAATT CAGGTTCTTT TCACTATTTT CTCAAAATCC TTTTCATCTT 3120

5 TCCCTCACGG TACTATTCAC TATCAACTTT TATTATATTA AATTTTATAA GATAACTCTT 3180

AATTATATTT ATATTATTCA TATAAAATAT ATTTTATAT TACTTAATTA AAATTTTACA 3240

TATATAATGT TTTAAATCTT TCAGTTCGCT CGCCACTACT ATGAAAATCG TTATTACTTT 3300

10 ATATTCCCTT AAGTACTAAG ATGATTCAGT TCCTTAAGTT TTTTAAAT ATTTATATAA 3360

AAATAAATTT TTATTCAGAT ACTTTTATAA TTTTAATAAT AAAAAATTTT AAATATATTT 3420

15 AATTTTTTAT AATTATAAAA ATTCGTAA TATATTTAAC GTCTTCTTC AATAATAAAA 3480

ATAATAGACA TCCTTTTAAA TTTATTATAT ATATTTAATT ATATATTTAA CTATATAAAT 3540

TATAAATTAA TTTATTTAAA ATAAGCGAAA AACGGAATTG AACCGATTAC CTTCGGAGCA 3600

20 TGAATCCGAC GAACTTTCCT TATGCTCTAT TTCGCTAAAT ACAATTAAAC TTGAAAAGAA 3660

TTGAACTTTT ATTTTATAAT TCGTACTTAT ATATTTTATC CATTAAATTA CAAGTTCATT 3720

25 ATATTATAAT ATATAAATTA TAAGTAATTA ACTTAGAGGT AAAGTTTCTG CTTTACATAC 3780

AGAAGATCAT TGGTTCGATT CCAATATTAC TTAAATAAAT CTATAATTTA ATGGATAAAA 3840

TAAAAACCTT CTAAGTTTAA TATGTAAGTT CAAATCTTAC TAGATTTAAT AATAATGAAT 3900

30 ATGGCGAAAA GGTAACGCG CTAAATTTAG AATTTAGTTT TTATAATAAT AAGAGTTCGA 3960

ATCTCTTTAT TCATATTTAT AATATACTTC TTAACTAGG ATTGAACTAG TATCTTTCGG 4020

35 TTAACAGCCG AATGCTTTAA CCACTAAGCT ATTAAGAATA TTAATATTAT ATTATATAAT 4080

ATATAATAGG GAATATAGTT TAATGGTAAA ATCTTATTCT TGCATAATAA AGATAGTAGT 4140

TCAATTCTAC TTATTTCCAT ATTATAAAAT CTATAAATGT TATAATTTTT AAATAATATA 4200

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TATATAATTA TATTGCGAGT TTGATCCTAG CTCAGAATGA ACGCTAGAAA TATACATTAC 4260  
ACATGCAAAT TTATGGATTA TATCATAGTG AATAGGTGAG GATATATAAA TTTTAAATT 4320  
5 TAAATAGATT ATAATATATA ATAATCTATA AGCGCATTTA TTTATATAAT TGTACTATAT 4380  
TAAAAATTAT TATTGTTTAA AATAAAATTT ATATTTGATT AACTAGTTGG TAAAAATAAA 4440  
GCCTACCAAG GTTATGATCA AAAATTGGTT TTAAAGAATG TACAATCACA TTAGGGGATTG 4500  
10 AAATAAGGCC CTAAATTTTT TTTAAATCAG CAGTGAGGAA TATTTTACAA TGAGCGTAAG 4560  
CTTGATAAAG TAATATTTCT TAAAGGATGA CAGTATATTT TTATATTGTA AACTTTATAT 4620  
15 TTTATTTTTA AATATTGATA AAAATAAAAC ATTAGTATTT GCTAATTTCT GTGCCAGCAG 4680  
CAGCGGTAAT ACAGAAAATA CCAGCGTTAT TCACTTTATT TGGCGTAAAG CGTTTAAAG 4740  
TTTTATATTA ATTTTATTTT AAAATATTTA ATTTAAATTT GAATAAAAAA TAAATAATAA 4800  
20 TATAATAAGA GTATTATAAA AGTATTAAGA ATTTTTTGAG AAGTAGTGAA ATGCAATGAT 4860  
ACAAAAAAGA ATACCAAAGG CGAAGGCATA ATACTATATA ATAAGTGACA CTTATAAACG 4920  
25 AAAGCTAAGG TAGCAAATAG GATTAGATAC CCTAGTAGTC TTAGCTGTAA ACTATGAATA 4980  
TTTTATATTT ATATATTAAT ATAAATATAA TAACTAACGT AATAAATATT CCGCCTGAGT 5040  
AGTATATTCG CAAGAACGAA ATTCAAAGGA ATTGACGGGA GCTTATACAA GTGGTGGAAC 5100  
30 ATGTGGCTTA ATTCGATGCA ACACGATAAA CCTTACCAA ATTAAACAAT ATTTTTATTA 5160  
TTAAGGAATT AATAGTTTAA TAAATATAT AGGTAGTGCA TGGCTGTCGT CAGTTCGTGC 5220  
35 TGTGAAGTAT TAATTTAAGT ATTATAACGA ACGTAACCCT TTTATAAAAA AAATTTTTTA 5280  
TAATATATTT ATTAAATATA TAAAAAGAC TACGTCAAGT CATTATGCTC CTTATATTTT 5340  
GGGCTGCTCA CGTGTTACAT AAAATATAAC AATATTTTAT TATATGAAAA TATAATATAT 5400  
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TAAATATATT TATAGTTCTG ATTATAAATT GAAACTCATT TATATGAAGA TCGAATCACT 5460  
 AGTAATCGCT AATAAGAAGT ATAGCGGTGA ATAAGTTCTT AAGCTTTGTA CACACCGCCC 5520  
 5 GTCACATCTG GAAAATATTA TATTATATAA AAATTATTGT AAAATAATAA TATATAATTA 5580  
 TATAATTTAG ATGAAGTCGT AACCAAGGTAG CCGTACTGGA AGGTGCGGCT GGATAATAAC 5640  
 ATAAAATTTT GGTGGAATTA TTTATTTAAA AATAATATTT ATATATAAAA GTAATTATAA 5700  
 10 TTATATAATT TTTATAGACA AAAATAGCAT TAATACACAT TAATGTAAAT TTAGTTAAAT 5760  
 ATTATTTTAT ATATATAAAG GTTTTTAGTT TAATGGTAAA ACATACTCTT GATAAGGGTA 5820  
 15 AGACTTTAGT TCAATTCTAA AATAACCTA 5849

(2) INFORMATION FOR SEQ ID NO:2:

(i) SEQUENCE CHARACTERISTICS:

- 20 (A) LENGTH: 1711 base pairs  
 (B) TYPE: nucleic acid  
 (C) STRANDEDNESS: single  
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

25 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:2:

TTCAGAAAAA TAGGATTGTA ACCTATATTC TTCTATTCCC AAAATAGATA TGTTACCATT 60  
 30 ACACTATATT CTGAATATTT AAAATTTTAT ACTTTTAAGG AAAATCGAAT TCCTATTTTC 120  
 TTCTTGAAAA AAAGATGICT TACCTTTAAA CGATAAAAGT AAAAAGTTAA ATTACCTGAG 180  
 ACTTGAAGTC AGAACCATTG GATTAAAAGT CGAGTACTCT ACCAATTAAG CTAGTAATTC 240  
 35 TTAATATAAC GAATCTGACG AGAATTGAAC TCGTATTCTT TGTATGACA AAATAATATT 300  
 TTAACCTAAT TAACTACAA ATTCAAATAA ATATATATAG GGAAAAGGGA TTCGAACCCCT 360  
 40 GGTATATATA ATATCTACAT AAATGTAGCA ATTTATAGCT ATAACCACTC AGCCATTTCT 420

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TAAATATAAT AAAAAAGGAA GATTTAATTT TTTTAACATT TTTATTTTAG GAGTTAAAAA 1680

TTTATCATA ATAATTTTAT ATTATAAAAT A 1711

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(2) INFORMATION FOR SEQ ID NO:3:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 516 base pairs

(B) TYPE: nucleic acid

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(ii) MOLECULE TYPE: DNA

(vi) ORIGINAL SOURCE:

(A) ORGANISM: Plasmodium berghei

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(vii) IMMEDIATE SOURCE:

(B) CLONE: CLONE PRB

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(xi) SEQUENCE DESCRIPTION: SEQ ID NO:3:

TTAATAGACA TGGACATAAA GGTGTTATTT CTTATATTAA TGATATTAAT GATATGCCTT 60

ATTTAAATAA CAAAATACAA CCTGATTAT TGTAAAGTGC TATTGGTATA CCTTCTAGAA 120

25

TAAATATAGG TCAAATATTA GAGGGTATAT ATGGATTAAA TAGTTTATAT TTAAATAATA 180

GATATATAAT ATCTAATAAT TTAAATACTA ATTATTATAA TAATTATATT AATAATTTTA 240

30 ATTATTATAA ATATAATTAT AATAATAATT TTGAATTCAA TAAAATATCA TATAATTATA 300

ATAAATATTT TTTAAAAAAT CCGTTTACGG GCCATTTAAT ACAGAATAGT ATTTGTTTAA 360

ATAATATTTA TTATTATAAA TTAGTACATA TGGTAAAAGA TAAATTAAGA TATAGATTCA 420

35

TAGGATTATA TTCTGAATTA ACTCAACAAC CTGTAAAAGG AAATACAAAA CAAGGAGGTC 480

AAAGATTGGG TGAAATGGAA GTATGGGCGC TAGAAG 516

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(2) INFORMATION FOR SEQ ID NO:4:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 161 base pairs
- (B) TYPE: nucleic acid

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(ii) MOLECULE TYPE: DNA

(vi) ORIGINAL SOURCE:

- (A) ORGANISM: Plasmodium berghei

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(vii) IMMEDIATE SOURCE:

- (B) CLONE: CLONE PWQ

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(xi) SEQUENCE DESCRIPTION: SEQ ID NO:4:

GTTCAAAAAT CAGATTGAC TGATAACACA TGGAACTTCA ATCCATTGCT CTACCATTGA 60

20

GCTATAATGA CTTAATAATA TTATTATTAT AATAGAATAT AACCAAAAGG TTAAGGTAAT 120

GAACTTTGAT TTCATTAAATA TAGGTTCGAA TCCTTTAGGA C 161

25 (2) INFORMATION FOR SEQ ID NO:5:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 17 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

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(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:5:

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GACCTGCATG AAAGATG

17

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(2) INFORMATION FOR SEQ ID NO:6:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 18 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:6:

GTATCGCTTT AATAGGCG

18

(2) INFORMATION FOR SEQ ID NO:7:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 18 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:7:

GCCACTACTA TGAAAATC

18

(2) INFORMATION FOR SEQ ID NO:8:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 18 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:8:

CGGTTTCATTC TGAGCTAG

13

(2) INFORMATION FOR SEQ ID NO:9:

(i) SEQUENCE CHARACTERISTICS:

- 5 (A) LENGTH: 24 base pairs  
(B) TYPE: nucleic acid  
(C) STRANDEDNESS: single  
(D) TOPOLOGY: linear

10 (ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:9:

GCGGTAATAC AGAAAATGCA AGCG

24

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(2) INFORMATION FOR SEQ ID NO:10:

(i) SEQUENCE CHARACTERISTICS:

- 20 (A) LENGTH: 26 base pairs  
(B) TYPE: nucleic acid  
(C) STRANDEDNESS: single  
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

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(xi) SEQUENCE DESCRIPTION: SEQ ID NO:10:

AGCACGAACT GACGACAGCC ATGCAC

26

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(2) INFORMATION FOR SEQ ID NO:11:

(i) SEQUENCE CHARACTERISTICS:

- 35 (A) LENGTH: 18 base pairs  
(B) TYPE: nucleic acid  
(C) STRANDEDNESS: single  
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

40 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:11:

ATCAGGAATA CGTCTAGG

18

(2) INFORMATION FOR SEQ ID NO:12:

- 5 (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 18 base pairs
  - (B) TYPE: nucleic acid
  - (C) STRANDEDNESS: single
  - (D) TOPOLOGY: linear

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(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:12:

15 GCTAGTATTA TGTCTTCT

18

(2) INFORMATION FOR SEQ ID NO:13:

- 20 (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 18 base pairs
  - (B) TYPE: nucleic acid
  - (C) STRANDEDNESS: single
  - (D) TOPOLOGY: linear

25 (ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:13:

CACCATTAAG TACATCAC

18

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(2) INFORMATION FOR SEQ ID NO:14:

- 35 (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 18 base pairs
  - (B) TYPE: nucleic acid
  - (C) STRANDEDNESS: single
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:14:

5 TGTTAATACA ACTCCAAT

18

(2) INFORMATION FOR SEQ ID NO:15:

(i) SEQUENCE CHARACTERISTICS:

- 10 (A) LENGTH: 18 base pairs  
(B) TYPE: nucleic acid  
(C) STRANDEDNESS: single  
(D) TOPOLOGY: linear

15 (ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:15:

GCTAGTATTA TGTCTTCA

18

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(2) INFORMATION FOR SEQ ID NO:16:

(i) SEQUENCE CHARACTERISTICS:

- 25 (A) LENGTH: 19 base pairs  
(B) TYPE: nucleic acid  
(C) STRANDEDNESS: single  
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

30 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:16:

GGAATGTTAT TGCTAACAC

19

(2) INFORMATION FOR SEQ ID NO:17:

35 (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 18 base pairs  
(B) TYPE: nucleic acid  
(C) STRANDEDNESS: single  
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:17:

5 GTAATCAATC TATGATAC

18

(2) INFORMATION FOR SEQ ID NO:18:

(i) SEQUENCE CHARACTERISTICS:

10

(A) LENGTH: 18 base pairs

(B) TYPE: nucleic acid

(C) STRANDEDNESS: single

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

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(xi) SEQUENCE DESCRIPTION: SEQ ID NO:18:

AATGAAGAGC TGTGTATC

18

20 (2) INFORMATION FOR SEQ ID NO:19:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 24 base pairs

(B) TYPE: nucleic acid

(C) STRANDEDNESS: single

25

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:19:

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GCGATAAGCC GACATCGAGG TGCC

24

(2) INFORMATION FOR SEQ ID NO:20:

(i) SEQUENCE CHARACTERISTICS:

35

(A) LENGTH: 24 base pairs

(B) TYPE: nucleic acid

(C) STRANDEDNESS: single

(D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:20;

24

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 36 base pairs

(B) TYPE: nucleic acid

(C) STRANDEDNESS: single

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

15

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:21:

CCTCGACTAC CATTTTAATA TCAATACCTA CCGGTA

36

20 (2) INFORMATION FOR SEQ ID NO:22:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 35 base pairs

(B) TYPE: nucleic acid

(C) STRANDEDNESS: single

.(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:22:

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AGGTGCAATT ATTGCATTGT TTACATTAGT AAGTA

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